

Attorney Docket No.: 0120101  
Application Serial No.: 10/054,359

**List of Claims:**

**Claim 1 (Previously Presented):** A method for generating a head related transfer function, comprising:

- measuring a plurality of impulse response for each individual of a sample group;
- for each individual of the sample group, converting each of the plurality of measured impulse responses to a set of head related transfer functions;
- averaging the sets of head related transfer functions for each of the individuals in the sample group to generate one average set of head related transfer functions;
- testing the average set of head related transfer functions to verify that it produces adequate sound for all members of a target population;
- wherein measuring each of the plurality of impulse responses comprises acquiring samples of a certain length using a certain sampling rate, and wherein the method further comprises, in the event that testing the average sets of head related functions does not verify that it produces adequate sound, adjusting the length of the samples and re-measuring the plurality of impulse responses for each individual of the sample group.

**Claims 2-3 (Cancelled)**

**Claim 4 (Previously Presented):** The method of claim 1, further comprising downconverting the acquired samples using a different sampling rate, thereby reducing the number of acquired samples.

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**Claim 5 (Cancelled):**

**Claim 6 (Previously Presented):** A method for generating a head related transfer

function, comprising:

measuring a plurality of impulse response for each individual of a sample group;

for each individual of the sample group, converting each of the plurality of measured impulse responses to a set of head related transfer functions;

averaging the sets of head related transfer functions for each of the individuals in the sample group to generate one average set of head related transfer functions;

testing the average set of head related transfer functions to verify that it produces adequate sound for all members of a target population;

wherein each of the plurality of measured impulse responses corresponds to a grid point in a coordinate system, and wherein the method further comprises performing coordinate conversion on the sets of head related transfer functions.

**Claim 7 (Original):** The method of claim 6, wherein performing coordinate conversion on the sets of head related transfer functions includes performing linear interpolation on the sets of head related transfer functions.

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**Claim 8 (Original):** The method of claim 1, further comprising dividing the sets of head related transfer functions into demographically defined groups and generating an average sets of head related transfer functions for each demographically defined group.

**Claim 9 (Original):** The method of claim 8, further comprising testing the generated average set of head related transfer functions for each demographically defined group to verify that each one produces adequate sound for an associated demographically defined target population.

**Claim 10 (Cancelled)**

**Claim 11 (Previously Presented):** A method for generating a head related transfer function, comprising:

measuring a plurality of impulse response for each individual of a sample group;

for each individual of the sample group, converting each of the plurality of measured impulse responses to a set of head related transfer functions;

averaging the sets of head related transfer functions for each of the individuals in the sample group to generate one average set of head related transfer functions;

testing the average set of head related transfer functions to verify that it produces adequate sound for all members of a target population;

decimating the average set of head related transfer functions to fit a filter engine of a target system;

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wherein decimating the average set of head related transfer functions includes using Fourier transform techniques and a sliding filter window.

**Claim 12 (Original):** The method of claim 11, wherein decimating the average set of head related transfer functions further includes using a minimum mean squared estimation.

**Claim 13 (Previously Presented):** A method for generating a head related transfer function, comprising:

- measuring a plurality of impulse response for each individual of a sample group;
- for each individual of the sample group, converting each of the plurality of measured impulse responses to a set of head related transfer functions;
- averaging the sets of head related transfer functions for each of the individuals in the sample group to generate one average set of head related transfer functions;
- testing the average set of head related transfer functions to verify that it produces adequate sound for all members of a target population;
- decimating the average set of head related transfer functions to fit a filter engine of a target system;
- normalizing the decimated average head related transfer function.

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**Claim 14 (Original):** A method for generating a head related transfer function, comprising:

- downconverting each of a plurality of measured impulse responses from a first sampling frequency to a second sampling frequency;
- converting each downconverted impulse responses to a set of head related transfer functions;
- performing coordinate conversion on each set of head related transfer functions;
- averaging the converted sets of head related transfer functions to generate one average set of head related transfer functions; and
- decimating the average set of head related transfer functions to fit a filter engine of a target system.

**Claim 15 (Original):** The method of claim 14, wherein converting each downconverted impulse responses to a set of head related transfer functions comprises generating a pair of head related transfer functions from the measured impulse responses for each grid point in a coordinate system.

**Claim 16 (Original):** The method of claim 15, wherein performing coordinate conversion on each set of head related transfer functions comprises performing coordinate conversion on the sets of head related transfer functions, and wherein performing coordinate conversion on the sets of head related transfer functions includes performing linear interpolation on the sets of head related transfer functions.

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**Claim 17 (Original):** The method of claim 14, further comprising dividing the converted sets of head related transfer functions into demographically defined groups and generating an average set of head related transfer functions for each group.

**Claim 18 (Original):** The method of claim 14, wherein decimating the average set of head related transfer functions includes using Fourier transform techniques and a sliding filter window.

**Claim 19 (Original):** The method of claim 18, wherein decimating the average set of head related transfer functions further includes using a minimum mean squared estimation.

**Claim 20 (Original):** The method of claim 14, further comprising normalizing the decimated average set of head related transfer functions.

**Claim 21 (Original):** A computer readable medium having stored thereon one or more sequences of instructions for causing one or more processors to perform steps for generating a head related transfer function, the steps comprising:

downconverting each of a plurality of measured impulse responses from a first sampling frequency to a second sampling frequency;

converting each downconverted impulse responses to a set of head related transfer functions;

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performing coordinate conversion on each set of head related transfer functions;  
averaging the converted sets of head related transfer functions to generate one average set of head related transfer functions; and  
decimating the average set of head related transfer functions to fit a filter engine of a target system.

**Claim 22 (Original):** The computer readable medium of claim 21, wherein converting each downconverted impulse responses to a set of head related transfer functions comprises generating a pair of head related transfer functions from the measured impulse responses for each grid point in a coordinate system.

**Claim 23 (Original):** The computer readable medium of claim 22, wherein performing coordinate conversion on each set of head related transfer functions comprises performing coordinate conversion on the sets of head related transfer functions, and wherein performing coordinate conversion on the sets of head related transfer functions includes performing linear interpolation conversion on the sets of head related transfer functions.

**Claim 24 (Original):** The computer readable medium of claim 21, further comprising the step of dividing the converted sets of head related transfer functions into demographically defined groups and generating an average sets of head related transfer functions for each group.

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**Claim 25 (Original):** The computer readable medium of claim 21, wherein decimating the average set of head related transfer functions includes using Fourier transform techniques and a sliding filter window.

**Claim 26 (Original):** The computer readable medium of claim 25, wherein decimating the average sets of head related transfer functions further includes using a minimum mean squared estimation.

**Claim 27 (Original):** The computer readable medium of claim 21, further comprising the step of normalizing the decimated average sets of head related transfer functions.

**Claim 28 (Currently Amended):** A system configured for ~~charitable donating~~  
generating a head related transfer function, the system comprising:

a processor;

a data storage area; and

an execution area configured to:

downconvert each of a plurality of measured impulse responses from a first sampling frequency to a second sampling frequency;

convert each downconverted impulse responses to a set of head related transfer functions;

perform coordinate conversion on each set of head related transfer functions;



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average the converted sets of head related transfer functions to generate one average set of head related transfer functions; and  
decimate the average set of head related transfer functions to fit a filter engine of a target system.

**Claim 29 (Original):** The system of claim 28, wherein converting each downconverted impulse responses to a set of head related transfer functions comprises generating a pair of head related transfer functions from the measured impulse responses for each grid point in a coordinate system.

**Claim 30 (Currently Amended):** The ~~computer readable medium~~ system of claim 29, wherein performing coordinate conversion on each set of head related transfer functions comprises performing coordinate conversion on the sets of head related transfer functions, and wherein performing coordinate conversion on the sets of head related transfer functions includes performing linear interpolation conversion on the sets of head related transfer functions.

**Claim 31 (Currently Amended):** The ~~computer readable medium~~ system of claim 28, wherein the execution area is further configured to divide the converted sets of head related transfer functions into demographically defined groups and to generate an average set of head related transfer functions for each group.

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**Claim 32 (Currently Amended):** The ~~computer-readable medium~~ system of claim 28, wherein the execution area is further configured to use Fourier transform techniques and a sliding filter window to decimate the average sets of head related transfer functions.

**Claim 33 (Currently Amended):** The ~~computer-readable medium~~ system of claim 32, wherein the execution area is further configured to use a minimum mean squared estimation to decimate the average sets of head related transfer functions.

**Claim 34 (Currently Amended):** The ~~computer-readable medium~~ system of claim 28, wherein the execution area is further configured to normalize the decimated average set of head related transfer functions.